DOCUMENT RESUME

ED 238 597 RC 013 208

AUTHOR	Monk, David H.; Bliss, James R.
TITLE	Financing Rural Schools in New York State. The Facts & Issues. Cornell Information Bulletin 182.
INSTITUTION	State Univ. of New York, Ithaca. Coll. of Agriculture and Life Sciences at Cornell Univ.
PUB DATE	Feb 82
NOTE	13p.
AVAILABLE FROM	Cornell University Distribution Center, 7 Research Park, Ithaca, NY 14850 ($1.50-20; quantity discounts available).
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Comparative Analysis; Declining Enrollment; Economic Change; Economic Factors; *Educational Finance; Elementary Secondary Education; *Population Distribution; *Property Taxes; *Resource Allocation; *Rural Schools; School Districts; Shared Services; Small Schools; Transportation
IDENTIFIERS	Isolation (Geographic); *New York; *Property Wealth; Sparsity (Population)

ABSTRACT

The resource allocation practices of New York State school districts were examined to determine how certain structural features of school districts can either create high tax rates or reduce educational opportunities for students. Study results indicated that rural districts spend less on instruction than do otherwise similar districts; however, rural taxpayers spend as high or higher a percentage of their income on education as those in nonrural districts. Rural districts also offer lower starting salaries to their teachers, operate with higher teacher-pupil ratios, provide fewer incentives to their teachers to obtain additional training, and rely more heavily on paraprofessional teacher aides. The inability or unwillingness of small districts to participate in Board of Cooperative Educational Services programs can have adverse implications for both students and taxpayers. Sparsely settled districts spend more per pupil on transportation than do more densely settled districts. Rural school officials and residents attribute the increase of property wealth in their districts to speculation rather than to real growth. Because districts with the same property wealth but different levels of income receive roughly the same amount of operating aid per pupil, any movement toward an increased use of an income-based measure of wealth will be advantageous to most rural districts. (CM)

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Financing Rural Schools in New York State

The Facts & Issues

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David H. Monk and James R. Bliss

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Financing Rural Schools in New York State

The Facts & Issues

by David H. Monk and

James R. Bliss

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Introduction

The Levittown versus Nyquist decision has prompted a renewed and rigorous debate over the alternative means that might be employed to finance elementary and secondary schools in New York State.[1] The case focused attention on the allegedly unconstitutional link that exists between the property wealth of a school district and the educational opportunities the district is able to provide. The original suit was brought by 27 school districts in 13 counties as well as by 12 children who attended school in 7 of the plaintiff districts. The court granted a second group of plaintiffs the right to intervene in the litigation. This group, known as the plaintiff intervenors, included the boards of education of the big four cities in the state (New York City, Rochester, Buffalo, and Syracuse). The intervenors argued that the state not only permits an unconstitutional link to exist between the fiscal capacity of a district and the provision of educational opportunities, but compounds the injustice by relying on flawed measures of fiscal capacity that artificially inflate the perceived ability of city districts to support education. The intervenors also argued that the state fails to recognize the extra costs associated with operating schools in urban settings.

Judge Kingsley Smith handed down his ruling in June 1978. Persuaded by the merits of both the plaintiff and the plaintiff intervenor arguments, Judge Smith issued an opinion that included an articulate discussion of the fiscal problems faced by large urban school districts in New York State. In October 1981, the Appellate Division of the State Supreme Court upheld Judge Smith's ruling. The case is currently under appeal.

Since the original decision, the governor and the board of regents appointed a special task force to "assemble the necessary background information on issues of equalization . . . and to prepare alternate approaches to a solution." This task force, the New York State Special Task Force on Equity and Excellence in Education, quickly developed an ambitious research agenda that included an analysis of the many difficult policy questions raised in the Levittown decision.

Given the urban flavor of the judge's opinion, it was not surprising to observe the heavy emphasis the task force placed on the issues brought to light by the big four cities in their intervening brief. For example, in addition to studies of cost differentials that exist around the state, the task force commissioned a study of municipal overburdens—the costly noneducational services that large municipalities must provide. It is argued that these burdens diminish the capacity of large cities to provide educational services.

As the debate within the task force developed, it became increasingly clear that policymakers had given insufficient attention to the fiscal problems faced by rural school districts in New York State. Certain members of the task force, as well as others from educational organizations around the state including the newly established Rural Schools Program at Cornell University, raised objections to the research agenda that was being followed by the task force. They also questioned certain methodological aspects of the research. Their objections focused on the lack of attention given to rural schools in general and to the heavy use of the nonmetropolitan category to represent rural schools. When analyses are made of the many types of districts that fall under the nonmetropolitan heading, many potentially important relationships are averaged out of the analysis. Frequently, the average for this category looks similar to the state average; this leads to the potentially erroneous conclusion that rural (nonmetropolitan) districts do not differ from nonrural districts in the state.

The critics also objected to the use of pupil-weighted figures to depict relationships between district background characteristics, such as the level of enrollment, and district spending practices. Pupil-weighted figures result from procedures that systematically deemphasize the importance of the numerous small districts in the

state. These procedures are appropriate if the researcher is interested in making generalizations about the average student. But if the goal of the analysis is to explore the nature of the state's responsibility for providing educational opportunities for all students, an exclusive reliance on pupil-weighted analyses can obscure serious inequities in the state aid formula that affect small school districts.

The task force responded to these criticisms by commissioning a study of the implications of the Levittown decision for financing rural schools. This study is now complete and was carried out by a faculty team in the Department of Education of the College of Agriculture and Life Sciences at Cornell University. The findings from the study will inform the debate that will be conducted over the next few years about the New York State Legislature's constitutional responsibility to finance rural schools.

Design of the Study

A major purpose of the study was to promote an understanding of how certain structural features of school districts can either create high tax rates or reduce educational opportunities for students. The study focused on the consequences of district characteristics that met two criteria: first, the characteristics had to be commonly found in districts that people intuitively think of as being rural; second, there had to be some reason for believing that these characteristics could contribute either to taxpayer burdens or reduced educational opportunities. Six district characteristics meeting these criteria were identified: (1) small-scale, (2) population sparsity, (3) district isolation within a BOCES, (4) decline in enrollment, particularly when it occurs in small districts, (5) rapid increases in full-value property wealth, and (6) large discrepancies between income and property-based measures of wealth.

To determine the consequences of these six characteristics, the resource allocation practices of school districts as measured by budget, staffing, and salary data were examined. Students' performance on standardized achievement tests (PEP tests) was also examined. These data are routinely collected by various agencies of the state education department and include information from every regular K-12 district in the state.

To avoid the criticisms of using pupil-weighted district level data, districts were not weighted by the number of pupils they serve. Although this is appropriate in light of the attention the task force had already given to pupil-weighted analyses, the results of Cornell's study must be interpreted with care because the numerous small districts in the state account for only a small fraction of the pupils in the state. Indeed, in 1978-79, the 67 smallest districts in the state enrolled only 1.3 percent of the students in the sample.

This bulletin presents only a small proportion of the findings presented to the task force and focuses on those findings that are likely to interest school administrators, school board members, parents, and taxpayers. A more detailed report of the findings is available from the Department of Education at Cornell University.[2]

Results of the Study

Scale of Operation

The rationale for exploring the consequences of a small-scale operation is relatively straightforward. Because of the indivisible nature of certain educational resources (e.g., administrative or teacher services) and because small-scale operations are unable to take advantage of the benefits of specialization, it costs more in small districts to achieve the same results than it does in otherwise equivalent large districts. If certain results cost more to achieve in small districts, several possible consequences can be imagined: (a) small districts can economize by cutting down on either the diversity of their services or on the quality of their services; (b) small districts can spend at higher levels than do otherwise equivalent districts and impose the attendant costs on taxpayers; or (c) small districts can encourage employees, students, and parents to work harder and, in effect, finance the extra costs through the use of these nonpurchased resources. For example, without reducing their teaching efforts, teachers might perform tasks that are ordinarily performed by administrators.

Spending Levels. Table 1 provides information about expenditure levels in small districts compared with large districts. All 670 regular K-12 districts were ranked by scale (as measured by the TAPU* pupil count) and were divided into ten equal groups. Means and standard deviations for a series of variables were calculated for each of the ten groups.

It appears that the smallest districts in the state spend at relatively high levels on a per pupil basis. Further analysis has revealed, however, that this result can be misleading. Specifically, the large standard deviation associated with the smallest districts reflects the amount of variation that exists among the smallest 67 districts in the state. It is also indicative of how dangerous it is to make generalizations about this grouping of districts. A case-by-case examination of these 67 districts revealed that two districts, Fishers and Shelter Island, tend to elevate the average expenditure level for all 67 districts. When these two district. are excluded from the sample, the mean for the general fund per pupil falls from $2527 to $2393. Further analysis also revealed that small-scale districts actually spend less than large-scale districts on a per pupil basis when appropriate statistical controls are applied. Does this tendency to spend less in small districts constitute lack of interest in education by taxpayers? From a policymaking perspective, this is a substantive question and raises another issue. To what degree are districts likely to use increased state aid resulting from school finance reform to reduce local

*Total aidable pupil units.

TABLE 1

Relationships between expenditure levels and patterns and school district scale, 1978–79

	1		2		3		4		5		6	
Total Aidable Pupil Units	General Fund Expenditure per Pupil		Local Levy Divided by Full Value (tax rate in mills)		Local Levy Divided by Local Income		Expenditure per Pupil on Instruction		Expenditure per Pupil on Transportation		Expenditure per Pupil on Boces	
*District Deciles**	*Mean*	*S.D.†*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
< 566	2527	1074	13.0	3.0	.08	.05	1359	549	158	66	162	82
566- 933	2184	373	13.4	2.5	.06	.03	1192	239	144	35	145	46
934-1303	2285	500	14.4	3.4	.05	.02	1250	316	136	49	107	44
1304-1553	2274	553	14.8	4.4	.05	.02	1243	328	132	47	94	43
1554-1968	2347	598	15.1	5.3	.04	.02	1319	381	122	40	98	45
1969-2549	2314	650	15.5	4.2	.05	.03	1271	363	129	42	76	21
2550-3311	2464	664	17.5	4.7	.05	.02	1398	424	119	48	75	34
3312-4472	2592	666	19.9	5.5	.05	.02	1486	417	117	49	73	36
4473-6962	2633	479	21.3	5.4	.05	.02	1511	316	119	44	68	39
>6962	2607	513	22.3	6.3	.06	.03	1508	322	99	36	54	30
All Districts	2423	630	16.7	4.6	.05	.03	1354	373	127	46	95	44

N = 670

*Deciles are nonpupil-weighted (each represents 10% of the districts and includes all regular K-12 districts with the exception of the "big 5" districts).

†Standard deviation: a measure of variation among the districts.

taxes rather than to enrich educational programs?

The figures also point to a relationship between the size of a district and what it spends on instruction. Once again, the high figures for the smallest districts are accounted for by Fishers and Shelter Island. Among districts that spend the same amount on education in general, smaller districts tend to spend less than larger districts on instruction. How might one explain this result?

One explanation is that small districts tend to spend more on transportation. Because small districts tend to be located in sparsely-settled areas (r=0.43) and, because sparsity is positively related to transportation costs per pupil (r=0.33), it is plausible to conclude that scale affects transportation through sparsity.[3] Because the state reimburses transportation expenditures at a high nominal rate, however, it is not clear that transportation draws resources away from instruction in ways that foster inequities between small and large districts.

Column 6 of table 1 provides information about the relationship between the scale of a district and its participation in BOCES programs. Clearly, small districts tend to spend more per pupil on BOCES services than do large districts. But it also appears that there is considerable variation in the degree to which small districts subscribe to BOCES services. This variation may be a cause for concern because it may mean that some small districts are unable to take advantage of the services BOCES offers. This possibility was examined and the results are reported in the *Isolation* section of this bulletin.

Resource Allocation Practices. Columns 7, 8, and 9 of table 1 provide insight into some of the consequences of a small-scale operation for district resource allocation practices. Smaller districts tend to have higher teacher-pupil ratios than larger districts. Even among districts that spend the same amount on education, the smaller districts hire more teachers per pupil. Because of the indivisible nature of teacher resources, small school districts may have little choice but to operate with smaller classes than do large districts that spend at the same overall level per pupil.

How do small districts finance their small class sizes? Four possibilities come to mind. First, they can purchase fewer nonteacher resources to offset the costs of small class size. The figures suggest that small districts make do with fewer nonteaching professional staff.

In contrast to the tendency of small school districts to hire fewer nonteaching professionals, small districts tend to hire more paraprofessional aides per pupil than large districts. This result is surprising. It raises a question about the degree to which small districts see hiring paraprofessional aides as a relatively inexpensive

7		8		9		10		11		12	
Full-Time Teachers per 1,000 Pupils		Full-Time Nonteaching Professionals per 1,000 Pupils		Full-Time Paraprofessional Staff per 1,000 Pupils		Beginning B.A. Teacher Salary ($)		Beginning M.A. Teacher Salary ($)		Percentage of Students Falling Below Minimal Competency as Measured by the PEP Test	
Mean	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
63.0	16.5	5.8	3.7	4.8	4.3	9,566	936	10,575	1,373	.19	.06
52.1	5.7	5.6	2.2	4.9	3.3	9,896	749	10,809	863	.18	.05
52.8	6.2	5.8	2.3	3.9	2.9	10,042	997	11,091	1,357	.17	.05
51.5	4.7	5.6	1.6	3.9	3.6	10,087	1,226	11,136	1,590	.15	.05
51.2	4.4	6.2	2.2	3.6	3.6	10,514	1,193	11,662	1,639	.16	.05
51.5	5.3	5.9	2.2	4.1	3.5	10,179	1,104	11,382	1,356	.17	.06
51.6	4.8	6.8	1.9	4.1	3.0	10,690	1,267	11,956	1,690	.16	.06
49.9	4.6	7.3	2.8	2.9	3.3	11,100	1,209	12,457	1,706	.15	.06
49.8	4.9	7.1	2.2	2.4	3.1	11,220	1,141	12,647	1,453	.15	.07
50.5	5.1	7.3	2.0	2.3	2.8	11,171	1,061	12,744	1,422	.15	.06
52.3	7.0	6.3	2.4	3.7	3.3	10,481	1,222	11,699	1,632	.16	.06

N = 670

*Deciles are nonpupil-weighted (each represents 10% of the districts and includes all regular K-12 districts with the exception of the "big 5" districts).

†Standard deviation, a measure of variation among the districts.

means of promoting specialization in their instructional programs.

A second means of financing small class size is to pay lower salaries to teachers. Findings indicate that small districts tend to provide lower teachers' salaries than larger districts. Moreover, the premium accorded starting teachers with master's rather than bachelor's degrees is positively related to scale. In contrast to larger districts, small districts appear to provide fewer incentives to teachers to acquire advanced training.

A third means of financing small class size involves the distribution of assignments among school personnel. If teachers in small districts perform the tasks ordinarily performed by administrators in large districts and also continue to perform their teaching duties, the teachers, in effect, underwrite the costs of smaller classes by working harder than teachers in larger districts. If teachers perform these administrative tasks and respond by reducing their teaching efforts, the cost is shifted to students in the form of reduced levels of instructional services. Unfortunately, aside from anecdotal evidence, it was not possible to examine the extent to which this option is pursued.

Finally, districts have the option of reducing the diversity of their curricular offerings. If fewer courses are offered, classes will be larger in that area of the curriculum where courses are combined. Taxpayers will benefit, but presumably at the expense of students who must contend with reduced opportunities to receive specialized instruction.

Although it may be inappropriate to link evidence regarding spending levels and resource allocation practices with aggregate measures of pupil performance on standardized examinations, it is potentially instructive to compare the performance of pupils in small districts with those in large districts. Contrary to what is commonly believed, small schools tend to have higher percentages of their students fall below the minimum level of competency as defined by the state than do larger schools. It appears that disproportionate numbers of students in small districts are failing to achieve what the state considers minimal levels of competency. Moreover, this result holds when controls are in place for background characteristics such as the property wealth of the district.

Willingness to Pay. Is it safe to conclude that because small districts spend less than large districts, taxpayers in small districts are less interested in education? Column 2 of table 1 reveals a positive relationship between the tax rate a school district imposes and the scale of the district. It appears that small districts tend to impose low tax rates and large districts tend to impose high tax rates.

These results are largely consistent with the claim that small schools, in

TABLE 2

Relationships between expenditure levels and patterns and school district sparsity, 1978-79

	1		2		3		4		5		6	
Sparsity (enrolled pupils per square mile)	General Fund Expenditure per Pupil		Local Levy Divided by Full-Value (tax rate in mills)		Local Levy Divided by Local Income		Expenditure per Pupil on Instruction		Expenditure per Pupil on Transportation		Expenditure per Pupil on BOCES	
*District Deciles**	*Mean*	*S.D.†*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
<6.83	2337	441	13.0	3.1	.0837	.0446	1253	228	163	47	159	79
6.83- 10.79	2123	313	13.9	2.6	.0524	.0190	1144	172	149	29	131	50
10.80- 16.50	2122	396	13.4	2.1	.0447	.0142	1151	254	145	37	110	48
16.51- 23.09	2109	301	13.9	2.2	.0413	.0189	1128	131	127	32	99	34
23.10- 34.49	2057	233	14.2	3.0	.0399	.0175	1144	125	126	36	82	33
34.50- 71.03	2226	378	16.1	3.0	.0444	.0183	1229	216	132	38	78	37
71.04-162.13	2549	587	18.5	4.9	.0507	.0209	1447	364	129	51	88	50
162.14-453.83	2746	722	19.7	5.7	.0584	.0370	1558	411	117	51	75	46
453.84-899.40	2927	712	21.3	6.0	.0553	.0268	1703	435	99	46	69	50
>899.40	2923	499	23.7	7.0	.0581	.0250	1730	324	88	40	64	34
All Districts	2415	486	16.8	4.3	.0528	.0257	1351	287	127	41	95	48

N = 652

*Deciles are nonpupil-weighted (each represents 10% of the districts and includes all regular K-12 districts with the exception of the "big 5" districts).

†Standard deviation, a measure of variation among the districts.

general, tend to be low spending districts that tax themselves at relatively low levels. A different type of relationship, however, is revealed when the level of local spending is compared with ability to pay as measured by income (rather than property wealth). Instead of finding that small districts spend less of their income than large districts on education—a finding that would be consistent with the thesis that small districts are low-effort districts—it appears that small districts tend to spend the same, if not a higher percentage of their income, on education as larger districts. Indeed, the smallest districts spend a higher fraction of their income on education than any of the other districts, and this result holds even when the two atypical districts (Fishers and Shelter Island) are removed from the analysis.

An income-based measure of effort or willingness to pay should be more refined than the variables considered in column 3 of table 1. Refined figures would account for the incomes of those taxpayers who own property within a given district but reside elsewhere. One conclusion of this study, however, is that an exclusive reliance on property tax rates to measure local effort is inappropriate and that it is premature to conclude that small districts are low-effort districts.

Sparsity

What is true for small districts compared with large districts is also true for sparsely-settled districts compared with densely-settled districts. Table 2 reports results that are quite similar to those found in table 1.

When considering the effects of sparsity on transportation costs and practices, it is apparent from table 3 that sparsely-settled districts spend more per pupil on transportation than do more densely-settled districts. Moreover, the ratio of approved to total expenditures is relatively low for the most and the least sparsely-settled districts in the state. Both densely-settled districts and sparsely-settled districts face relatively low effective aid ratios. Sparsely-settled districts spend a larger fraction of their transportation budgets on district-operated transportation services. Sparsely-settled districts also tend to transport fewer nonallowed* pupils than do more densely-settled districts.

The latter two findings have implications for the rate at which the state provides aid for transportation. The greater the tendency for a district to transport nonallowed pupils, the lower the rate at which aid is provided for transportation. Hence, it is not surprising to find that densely-settled districts, given their tendency to transport fairly high numbers of nonallowed

*The costs of transporting nonallowed pupils are not reimbursed by the state.

7		8		9		10		11		12	
Full-Time Teachers per 1,000 Pupils		Full-Time Nonteaching Professionals per 1,000 Pupils		Full-Time Para-professional Staff per 1,000 Pupils		Beginning B.A. Teacher Salary ($)		Beginning M.A. Teacher Salary ($)		Percentage of Students Falling Below Minimal Competency as Measured by the PEP Test	
Mean	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
57.6	12.2	5.3	2.0	5.7	4.3	9,817	702	10,747	881	.20	.06
52.7	6.0	5.6	3.2	4.4	2.9	9,567	583	10,509	728	.19	.05
52.0	6.0	5.4	1.9	4.9	3.2	9,665	697	10,582	1065	.18	.05
50.5	5.2	5.5	1.8	3.9	3.0	9,749	601	10,692	691	.17	.05
50.0	4.0	6.0	2.3	3.0	2.6	9,895	753	10,887	902	.17	.05
50.0	5.4	6.0	1.7	4.2	3.6	10,355	804	11,425	991	.16	.04
50.5	5.6	7.0	1.7	3.3	3.5	10,944	1174	12,181	1554	.14	.04
51.7	4.9	6.9	2.4	2.6	3.8	11,055	1332	12,586	1710	.13	.06
53.5	6.7	7.5	2.4	2.6	3.5	11,698	1083	13,272	1482	.15	.06
53.2	6.3	8.0	2.5	2.4	2.9	11,683	1031	13,388	1443	.16	.07
52.2	6.6	6.4	2.2	3.7	3.4	10,480	1212	11,694	1622	.16	.05

N = 652

*Deciles are nonpupil-weighted (each represents 10% of the districts and includes all regular K-12 districts with the exception of the "big 5" districts).

†Standard deviation, a measure of variation among the districts.

students, face relatively low levels of transportation aid as a fraction of their transportation expenditures.

The willingness to transport nonallowed pupils is not a reason for the low rate at which the state matches transportation expenditures in sparsely-settled districts. These districts tend to transport nonallowed pupils relatively infrequently. An alternative explanation for the low matching rates in sparsely-settled districts involves the parity issue. During the period under study, the state disallowed certain expenditures that districts operating their own fleets incurred and, at the same time, approved analogous expenditures made by districts relying on contracted services.

Isolation

In analyzing the relationships between scale of operation and spending patterns, a surprising amount of variation was found in the level at which small districts spend for BOCES services. This variation is potentially troubling because the concept of shared services that the BOCES program embodies constitutes a viable means of offsetting many of the costs that small-scale entails. To the extent that this is true, the inability or unwillingness of small districts to participate in BOCES programs can have adverse implications for both students and taxpayers.

In light of this, researchers tried to identify impediments that limit the ability of districts to participate in BOCES programs. The term isolation was used to refer to these impediments, and two distinct types of isolation were considered. First, an isolated district was defined as one that is different in some fundamental way from the other districts in the local BOCES. The example that is frequently given for this type of isolation involves a situation where a rural district with interests in shared basic services is surrounded by suburban districts with interests in more specialized services such as instruction in dance and the visual arts.

The second type of isolation was measured by the number of miles between the local district and the nearest regional BOCES center. This was labeled as geographic isolation. Even where districts are quite similar to their neighbors, if students have to spend excessive time in transit on a regular basis, this can seriously reduce the willingness of the districts to participate in BOCES programs.

The first step in this analysis was to document the degree of isolation that exists within the state. Findings showed a considerable degree of isolation. For example, 246 districts in the state are situated in a BOCES where, on the average, they are either smaller, wealthier, or geographically larger than their fellow cooperating districts. Moreover, there are 47 regular K-12 dis-

TABLE 3

Relationships between selected characteristics of transportation services and school district sparsity, 1978–79

	1		2		3		4		5	
Sparsity (enrolled pupils per square mile)	Expenditure per Pupil on Transportation		Approved Transportation Expenditures Divided by Total Transportation Expenditures		State Aid for Transportation Divided by Total Transportation Expenditures		Expenditures on District-Operated Transportation Services Divided by Total Transportation Expenditures		Percentage of Transported Pupils Considered Non-allowed for Aid Purposes	
*District Deciles**	*Mean*	*S.D.†*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
<6.83	163	47	.88	.08	.70	.13	.78	.21	.10	.08
6.83- 10.79	149	29	.87	.11	.71	.12	.79	.17	.07	.05
10.80- 16.50	145	37	.91	.08	.73	.11	.81	.24	.08	.06
16.51- 23.09	127	32	.92	.05	.77	.12	.83	.23	.09	.09
23.10- 34.49	126	36	.94	.07	.76	.09	.70	.35	.07	.06
34.50- 71.03	132	38	.94	.08	.75	.09	.72	.35	.09	.07
71.04-162.13	129	51	.93	.09	.73	.08	.55	.42	.12	.08
162.14-453.83	117	51	.89	.12	.73	.12	.38	.36	.19	.16
453.84-899.40	99	46	.87	.14	.69	.15	.22	.30	.20	.15
>899.40	88	40	.85	.15	.66	.14	.15	.24	.24	.17
All Districts	127	41	.90	.11	.72	.12	.59	.38	.13	.12

N = 652

*Deciles are nonpupil-weighted (each represents 10% of the districts and includes all regular K-12 districts with the exception of the "big 5" districts).

†Standard deviation, a measure of variation among the districts.

tricts in the state that are more than 25 miles away from the nearest BOCES program.

The second step in the analysis involved checking to see whether district isolation makes a difference in the degree to which individual districts participate in BOCES programs. In general, these analyses showed that district isolation was not related systematically to the level of spending per pupil on BOCES services. Although this may suggest that isolation poses no real hardships for school districts, several points should be kept in mind. First, isolated districts may have little choice over their level of participation, especially if the services are mandated by the state. Second, the fact that geographic isolation is not systematically related to participation levels of districts suggests that substantial numbers of students are traveling between 50 and 120 miles a day on a regular basis. Third, the measure of participation used in this study is at best a first approximation of the average level of participation in all BOCES programs. A more refined measure that examines participation in specific programs may reveal different results.

These points suggest that the effects of isolation deserve more attention. A series of case studies could provide the state with the information it needs to assess the impact of isolation on educational opportunities. Until these case studies are complete, it would be unwise to draw conclusions about the impact of isolation on the cost and delivery of educational services.

Changes in Enrollment

The chief reason for expecting enrollment change, specifically enrollment decline, to make a difference in the allocation of educational resources stems from the idea that certain rigidities exist within school systems that make it difficult for officials to respond quickly to an abrupt or unanticipated change in enrollment. An example would include provisions in teachers' contracts that may either retard the speed at which a district's faculty is reduced or affect the willingness of administrators to reduce staff in districts experiencing decline. It was found that districts experiencing the greatest percentage of enrollment decline tend to spend at high levels per pupil on the general fund as well as on expenditures directly related to instruction. As one might expect, these districts also operate with relatively high teacher-pupil ratios, somewhat higher nonteaching professional per pupil ratios, and lower paraprofessional aide per pupil ratios.

One thesis that was tested in this study was the claim that an equivalent decline in percentage terms is more burdensome in a district that is already small compared with a large district.

This phenomenon was examined by checking to see whether the impact of a given percentage decline in enrollment varies depending on the scale of the district. A stronger relationship was found between the percentage change in enrollment and spending levels as well as teacher-pupil ratios in the smaller districts. These results are consistent with the argument that a loss of 5 percent of the student body in a small district is more serious than the loss of 5 percent in a large district. The state may have a responsibility for treating declining small districts differently from declining large districts. Currently, no such distinction is drawn.

Measuring Ability to Pay

Attention is given here to burdens that stem from the state's inaccurate determination of a school district's ability to pay for educational services. Researchers analyzed the impact of changes in full-value property wealth over time and studied the implications of a large discrepancy between a school district's property and income measures of wealth.

Changes in Property Wealth. To measure changes in full-value property wealth over a recent 5-year period, information was collected about districts' property wealth for the 1973-74 school year and for the 1978-79 school year. These two figures were used to calculate the percentage change in full-value property wealth for each of the regular K-12 districts in the state. Table 4 shows the results of comparing the average percentage gain in property wealth for rural districts with the average gain of nonrural districts. A rural district was defined as having fewer than 1553 students (TAPU) *and* fewer than 23 students enrolled per square mile. During the 1974-79 period, property wealth had been rising at a higher rate in rural school districts than elsewhere. This result corroborates the findings of numerous efforts by rural school officials to document differences in growth rates of rural districts compared with other school districts.[4] What is potentially important about this finding is that it holds in general for a collection of school districts that have only their small-scale and sparsely-settled populations in common. This result cannot be attributed to unusual events occurring in a single county or region of the state. It is a result that applies to a substantial number of school districts located in more than 41 counties in the state.

According to rural school officials and district residents, the rapid rise in the full value of rural districts relative to other districts is due to speculation and is more accurately thought of as paper wealth and not real growth in the rural districts' ability to finance education. If this assertion has merit, it should be possible to show that the nature of the impact of an equivalent gain in property wealth in a school district depends on whether the district is located in a rural area of the state. When this analysis was carried out, it was found that the relationship between gains in property wealth and spending levels was significantly different for the rural districts.

Although this result cannot be used to justify the claims rural people make about the paper wealth phenomenon, it is consistent with what one would expect to find if the paper wealth allegations have merit. It follows that the state would be well-advised to distinguish between gains in real wealth that are real in the sense that they are permanent and those that are temporary or artificial. Further research is necessary before the appropriate response by the state can be determined.

Discrepancies in Wealth Measures. The discrepancy between property and income measures of wealth is the final background characteristic that was examined in this study. To measure the discrepancy that can exist in a district between property- and income-based measures of ability to pay, districts were ranked by both income and property wealth and, for each district, the two rankings were compared. Table 5 illustrates these discrepancies. All districts falling into cells that are off the northeast/southwest diagonal of table 5 are, to some degree, faced with a discrepancy between their income and property-based measures of wealth. Several interesting results can be found in this table. For example, it appears that

TABLE 4

Average percentage increases in full-value wealth over time for selected categories of school districts, 1974-79

	Mean Percentage Increase in Full-Value Property Wealth	*S.D.**	*N*
Whole Sample	104.2	62.5	635
Districts with fewer than 1553 students (TAPU) and with fewer than 23.09 students enrolled per square mile.	140.8	44.6	205
Districts with fewer than 933 students (TAPU) and with fewer than 10.79 pupils enrolled per square mile.	160.8	50.6	91
Districts with more than 2550 students (TAPU) and with more than 71.03 pupils enrolled per square mile.	73.0	69.3	189
Districts with more than 4,473 students (TAPU) and with more than 453.83 pupils enrolled per square mile.	72.9	112.7	65

*Standard deviation, a measure of variation among the districts.

expenditures are not sensitive to income levels for the low property wealth districts. For the middle and high wealth districts, the expected positive relationship between expenditures and income is obtained. Moreover, for the low-income wealth districts, higher levels of property wealth appear to have little influence on spending levels until the upper quartile of the property wealth distribution is reached. Finally, as might be expected, districts that have the same property wealth but different levels of income receive roughly the same amount of operating aid per pupil.

Further analysis showed that the small and sparsely-settled districts tend to be concentrated in the cells of table 5 that indicate high levels of property wealth relative to income wealth. Specifically, 65 percent of the districts falling into cells to the left of the northeast/southwest diagonal of the table have fewer than 1553 pupils and fewer than 23 pupils per square mile. Of the 16 districts that fall into the extreme northwest cell of the table, 13 or 81 percent of the districts are small and sparsely settled.

These results suggest that any movement toward an increased use of an income-based measure of wealth will work to the advantage of most rural districts. Indeed, of the 202 districts classified as being rural, only 13 look substantially wealthier in income than in property.

Researchers examined the potential impact the various income adjustments currently being considered by the task force would have on rural

TABLE 5

New York State regular K-12 school districts by wealth characteristics, 1978-79

Equalized Property Wealth per Pupil (RWADA)		***Gross income per pupil (TAPU)***					
		Lowest Quartile <$14,427		*Middle Two Quartiles $14,427-26,141*		*Highest Quartile >$26,141*	
		Mean	*S.D.**		*Mean*	*S.D.*	*Mean*	*S.D.*
Highest Quartile >$80,538	*General Fund Expenditure Per Pupil*	2711	510	*General Fund Expenditure Per Pupil*	2726	633	*General Fund Expenditure Per Pupil*	3381	817
	State Operating Aid Per Pupil	565	197	*State Operating Aid Per Pupil*	533	143	*State Operating Aid Per Pupil*	505	109
	N = 16			N = 48			N = 106		
Middle Two Quartiles $43,463-80,538	*General Fund Expenditure Per Pupil*	2089	215	*General Fund Expenditure Per Pupil*	2214	330	*General Fund Expenditure Per Pupil*	2521	390
	State Operating Aid Per Pupil	927	95	*State Operating Aid Per Pupil*	887	112	*State Operating Aid Per Pupil*	811	119
	N = 65			N = 204			N = 63		
Lowest Quartile <$43,463	*General Fund Expenditure Per Pupil*	2059	235	*General Fund Expenditure Per Pupil*	2040	181	*General Fund Expenditure Per Pupil*	2155	198
	State Operating Aid Per Pupil	1109	63	*State Operating Aid Per Pupil*	1054	52	*State Operating Aid Per Pupil*	1019	34
	N = 84			N = 81			N = 3		
N = 670									

*Standard deviation, a measure of variation among the districts.

districts, and found that a multiplicative adjustment with a pupil count in the denominator is the most advantageous for rural schools. The analysis also showed, however, that this is not the case for all rural districts. The school districts considered rural in the research, those with fewer than 1553 students and in regions with fewer than 23 pupils per square mile, are a remarkably diverse group. It is not surprising to find that some rural districts will be better off by an income adjustment, and others will be better off by alternative adjustments.

Summary

Although the research reported in this bulletin is now complete and the findings have been presented to the task force, it is clear that additional research needs to be carried out. It is extraordinarily difficult to document instances of inequities that affect rural school districts using aggregate data that are collected by the state for other purposes. Future research on rural school problems in New York State will most likely involve greater emphasis on case study types of methodologies.

In closing, it is useful to summarize the story the data tell about rural schools in New York State. The research shows that rural districts spend less on instruction than do otherwise similar districts; they operate with higher teacher-pupil ratios; rural districts offer lower starting salaries to their teachers; they provide fewer incentives to their teachers to obtain additional training; and they rely more heavily on paraprofessional teacher aides. Moreover, there are theoretical reasons for believing that rural schools offer fewer specialized courses and expect their teachers to perform more noninstructional (quasi-administrative) tasks than do nonrural schools. In rural schools, the rate at which students fall below minimum competency levels is relatively high. And finally, from the taxpayer's perspective, evidence suggests that the fraction of their income that rural taxpayers spend on education is as high if not higher than the fraction spent in nonrural districts.

Viewed collectively, these results indicate that burdens exist in rural school districts. In the months to come, the task force and the New York State Legislature will debate the nature and extent of the state's responsibility to offset these burdens as a part of the effort currently under way to reform New York State's system of providing state aid for education.

Suggested Reading

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Notes

1. *Board of Education v. Nyquist*, [94 Misc 2d 466].

2. Monk, David H., Kenneth A. Strike, and Frederick H. Stutz. *The Potential Effects of the Overburden Argument on the Funding of Rural Schools*. Department of Education, Stone Hall, Cornell University, Ithaca, New York 14853.

3. The correlation coefficient is a measure of a linear relationship between two variables. It varies between -1 and +1. A positive coefficient indicates that the two variables increase together. A negative coefficient indicates that one variable increases as the other decreases. See Snedecor and Cochran, *Statistical Methods*, 6th ed. (Iowa: Iowa State University Press, 1967).

4. Davis, Charles E. "Truth or Consequences: Equalization and Assessment." *The Council Journal*, a publication of the New York State Council of School District Administrators, vol. 2, fall 1981.

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